

U-5007

# FEASIBILITY STUDY

**Towns of Matthews and Mint Hill**

**Widening of NC 51  
from US 74 (Independence Boulevard) to SR 3128 (Lawyers Road)**


**Mecklenburg County**


**Division 10**

**FS-0310A**



**Prepared by the  
Program Development Branch  
N. C. Department of Transportation**

  
**Lynnise M. Hawes  
Feasibility Studies Engineer**

  
**Derrick W. Lewis, P.E.  
Feasibility Studies Unit Head**

  
**Date**

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## I. General Description

This feasibility study describes the proposed widening of NC 51 from US 74 (Independence Boulevard) to SR 3128 (Lawyers Road), a distance of approximately 5.5 miles. The project location is shown on Figure 1. As part of the study, two different cross-sections were investigated, the details of which are as follows:

- ◆ **ALTERNATIVE #1 (INTERIM):** Four-lane divided shoulder section on 150' of right-of-way.
- ◆ **ALTERNATIVE #2:** Six-lane divided curb and gutter section on 150' of right-of-way.

This is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. The purpose of this study is to describe the proposed project including cost, and to identify potential problems that may require consideration in the planning and design phases.

## II. Background

The purpose of this project is to promote a safe traveling environment and to reduce traffic congestion along NC 51, a major residential and commercial area. The Town of Mint Hill, the Town of Matthews, Mecklenburg County, and the Mecklenburg-Union Metropolitan Planning Organization support this project.

NC 51 is designated as a principal arterial in the North Carolina Statewide Functional Classification System and as a major thoroughfare in the 1994 Mecklenburg Thoroughfare Plan. NC 51 currently varies from a two-lane to a four-lane divided shoulder section with varying pavement widths between 32 and 62 feet from edge of pavement to edge of pavement. Curb and gutter is located along NC 51 from US 74 (Independence Boulevard) to Reid-Harkey Road.

There are two existing bridges within the project corridor. Both bridges are located at the intersection of NC 51 and US 74. Bridge No. 668 is a 193' long and 45' wide, 3-lane bridge with a reinforced concrete deck. Bridge No. 669 is a 197' long and 33' wide, 2-lane bridge with a reinforced concrete deck. Both bridges were built in 1995 and have a sufficiency rating of 83%. No improvements are proposed for these bridges.

### III. Traffic and Safety

The existing traffic signals will need to be upgraded to accommodate the proposed improvements. They are located at the following intersections:

- Westbound US 74 Ramp
- Northeast Parkway
- SR 3176 (Phillips Road)
- SR 3174/SR 3143 (Idlewild Road)
- SR 3128 (Lawyers Road)

The current year Average Daily Traffic (ADT) along NC 51 ranges from 16,700 to 28,000 vehicles per day (vpd). For the design year 2030, the traffic volume along NC 51 is estimated range between 28,600 to 40,400 vpd. Truck traffic is estimated to make up approximately 5 percent of the daily traffic.

The existing segment of NC 51 operates between a level of service (LOS) E and F under current traffic volumes, and degrades to LOS F by the 2030 design year. If widened to a four-lane divided section, NC 51 would provide an acceptable level of service through most of the design period, but by 2030 a six-lane divided facility will be required.

Between 2001 and 2004, 239 crashes were reported within the project limits. The crash rate for NC 51 is 340.73 crashes per 100 million vehicle miles (crashes/100MVM) traveled. This rate is higher than the statewide rate of 334.95 crashes/100MVM for two-lane undivided urban North Carolina route. There were 84 injury crashes, 154 property damage only crashes, and 1 fatal crash. The most prevalent types of crashes were Rear End (48%) and Angle (18%). 54% and 33% of the crashes reported at SR 3176 (Phillips Road) and SR 3143/SR 3174 (Idlewild Road) were Rear End crashes, respectively. With the proposed widening and the addition of turn lanes, the number and the severity of these types of crashes are expected to decrease.

### IV. Description of Alternatives

It is proposed to widen NC 51 from US 74 (Independence Boulevard) to SR 3128 (Lawyers Road), a distance of approximately 5.5 miles. The project location is shown on Figure 1. Two different cross-sections were studied. The details of each are below:

**ALTERNATIVE #1 (INTERIM):** Four-lane divided section, 79' from edge of pavement to edge of pavement, with 8' shoulders (4' of which are paved) and a 23' raised grass median on 150' of right-of-way. Should the ultimate section be desired in the future (a six-lane divided curb and gutter section with a raised grass median), the 150' right-of-way will allow for ease in retrofitting.

With this proposed cross-section, it is anticipated that there will be thirteen (13) residences and seven (7) businesses relocated due to this project. The total cost of

this alternative, including construction and right-of-way, is estimated to be \$45,600,000.

Right-of-way.....	\$21,700,000
Construction.....	\$23,900,000
Total Cost (Alternative #1).....	\$45,600,000

The section of NC 51 from US 74 (Independence Boulevard) to Matthews-Mint Hill Road (approximately 1.0 mile) is an existing four-lane divided section. If the 150' of right-of-way in this section is not acquired as part of this alternative, the cost could be reduced by \$600,000.

**ALTERNATIVE #2:** Six-lane divided curb and gutter section, 103' from face of curb to face of curb, with 14' outside lanes to accommodate bicycles, a 23' raised grass median, 15' berms, and 5' sidewalks on 150' of right-of-way.

The estimated construction cost for sidewalks on both sides of the roadway is \$1,800,000. This cost is included in the estimated construction cost below.

With this proposed cross-section, it is anticipated that there will be thirteen (13) residences and seven (7) businesses relocated due to this project. The total cost of this alternative, including construction and right-of-way, is estimated to be \$58,500,000.

Right-of-way.....	\$21,700,000
Construction.....	\$36,800,000
Total Cost (Alternative #2).....	\$58,500,000

NC 51 is a Level 3 designated bike route in accordance with the Mecklenburg/Union Counties Bicycle Suitability Map. According to the AASHTO standard, the outside lanes in a curb and gutter section shall be 14 feet and the paved shoulders in a shoulder section shall be 4 feet. Both alternative cross-sections include the appropriate bicycle accommodations.

In addition to the multi-lane widening of NC 51, the following intersection improvements are recommended and are included in the costs shown above:

- Matthews-Mint Hill Road
  - addition of a northbound right turn lane on NC 51
  - addition of southbound dual left turn lanes on NC 51
  - addition of an eastbound through lane on Matthews-Mint Hill Road for 1300'
  - addition of westbound dual right turn lanes on Matthews-Mint Hill Road
- SR 3176 (Phillips Road)
  - addition of a northbound right turn lane on NC 51

- SR 3143/SR 3174 (Idlewild Road)
  - addition of northbound dual left turn lanes on NC 51
  - addition of southbound dual left turn lanes on NC 51
  - addition of an eastbound through lane on Idlewild Road for 1800'
  - addition of westbound dual left turn lanes on Idlewild Road
  - addition of a westbound through lane on Idlewild Road for 1800'
- SR 3135 (Lebanon Road)
  - addition of northbound dual left turn lanes on NC 51
  - addition of a westbound through lane on Lebanon Road for 1400'
  - addition of eastbound dual right turn lanes on Lebanon Road
- SR 3128 (Lawyers Road)
  - addition of northbound dual left turn lanes on NC 51
  - addition of a northbound right turn lane on NC 51
  - addition of southbound dual left turn lanes on NC 51
  - addition of southbound dual right turn lanes on NC 51
  - addition of a westbound through lane on Lawyers Road for 1400'
  - addition of westbound dual left turn lanes on Lawyers Road
  - addition of a westbound right turn lane on Lawyers Road
  - addition of an eastbound through lane on Lawyers Road for 1400'
  - addition of an eastbound right turn lane on Lawyers Road

In order for the full capacity benefits of the multi-lane widening to be realized, the recommended intersection improvements shown above need to occur.

## **V. Community Issues**

A detailed community impact investigation was not conducted for this feasibility study, however no impacts to schools, parks, recreation areas, or community facilities are anticipated with this project.

Maps at the Survey and Planning Branch of the North Carolina State Historic Preservation Office were used to determine if any historic properties on the National Register of Historic Places (NRHP) or state lists exist within the proposed project corridor. Three properties within the project corridor were found to be potentially historic properties: the Ferguson House, the Flow-Lee House, and the Smith Wilson House.

## **VI. Natural Environment Issues**

The following is a preliminary review of environmental issues that might have a potential impact to the project. The information obtained for the environmental screening is from a Geographic Information System (GIS) database. The purpose of the environmental screening is to identify potential environmental issues early in the process.

## **Stream Classification and Wetlands**

The proposed project corridor is located in the Catawba and Yadkin River Basins. The project corridor does not cross any water bodies or streams. Therefore, it is anticipated that there will be no impacts to wetlands.

## **Threatened and Endangered Species**

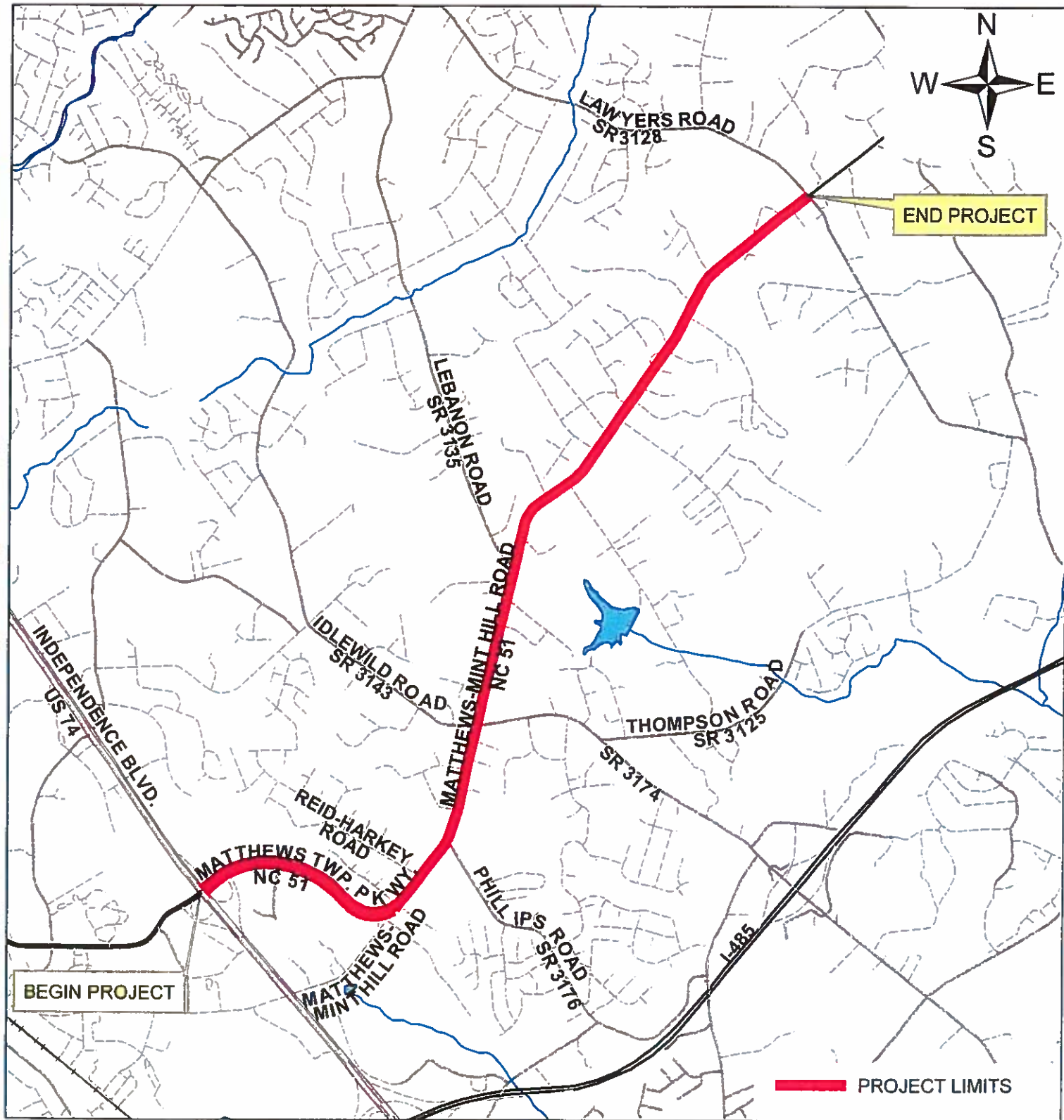
There were no threatened and endangered species identified within the project corridor.

## **VII. Recommendations**

**ALTERNATIVE #1 (INTERIM):** It was found that the four-lane divided shoulder section would not be able to accommodate projected design year traffic volumes. However, only the intersection of NC 51 and SR 3174/SR 3143 (Idlewild Road) fails in design year. If this alternative were built as an interim improvement for the ultimate six-lane section, it would provide acceptable operations through year 2028.

**ALTERNATIVE #2:** It was found that the six-lane divided curb and gutter section would be able to accommodate the projected design year traffic volumes with an acceptable LOS. ***Alternative #2 would be the preferred option for the proposed NC 51 widening.***

The total project cost of the preferred Alternative #2 with a six-lane divided curb and gutter section, 12' travel lanes, 14' outside travel lanes, sidewalks on both sides of the roadway on 150' right-of-way and all recommended intersection improvements is \$58,500,000.



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
PROGRAM DEVELOPMENT BRANCH

FS-0310A

NC 51  
FROM US 74 (INDEPENDENCE BOULEVARD)  
TO SR 3128 (LAWYERS ROAD)

MATTHEWS AND MINT HILL, MECKLENBURG COUNTY

DIVISION 10

FIGURE 1